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Study of Toxoplasmosis in Hemodialysis Patients and Applicant of Marriage Peoples in Thi-Qar Province

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Abstract*--*The aims of this study is to assess some seroprevalence of toxoplasmosis in chronic renal failure (CRF) patients undergoing hemodialysis in dialysis centers of Al-Hussian Hospital/Thi-Qar provinace. The blood samples were tested with enzyme linked Immunosorbant assay (ELISA) IgG and IgM to determine the incidence of toxoplasmosis in hemodialysis patients. 36 sample of all 100 (31.11%) of hemodialysis patients showed infection with Toxoplasma gondii. The highest percentage (41.2%) seropositive of anti-Toxoplasma IgG was found in age groups (40-44) year. An increase of the seropositivity rate was detected with increasing length time on hemodialysis treatment. Females had the highest significant percentage of anti-Toxoplasma IgG 24 (46.2%) than males 12 (31.6%).

Key words*--*T. gondii, PCR, Hemodialysis Patients, applicant of marriage, Thi-Qar

I. INTRODUCTION

Toxoplasma gondii, is one of the most common protozoan parasite, it is a causative agent of toxoplasmosis, throughout the world [1]. It belongs to the phylum Apicomplexa[2]. Undercooked meat containing tissue cysts and fecal contamination of hands are a greater risk factors [3]. The infection can also be transmitted vertically from an infected woman to her fetus during pregnancy via tachyzoites contained in blood products, [4].

Infection with *T. gondii* may cause severe complications in pregnant women and immunocompromised patients [5], such as Human Immunodeficiency Virus, Acquired Immunodeficiency Syndrome (HIV/AIDS) [6], cancer patients [7], renal disease with hemodialysis patients and those having organ transplantation [8]. Such patients have deficient cellular immunity and this makes them susceptible to the infection [9]. Toxoplasmosis also transmitted by blood transfusion.

Many studies have been carried out on the immune response in patients with chronic renal failure (CRF), and proved there was impairment of cell- mediated immunity [10].

This study was aimed to assess the seroprevalence of toxoplasmosis in CRF patients undergoing hemodialysis in some dialysis center in Nasiriya Hospital and by testing blood samples with (ELISA) anti-*T. gondii* IgG and IgM specific antibodies and to determine the incidence of clinically confirmed toxoplasmosis in renal patients and applicant of marriage peoples.

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II. MATERIALS AND METHODS

Blood samples were collected during the period from October 2017 till October 2018 from a total of 100 patients undergoing hemodialysis treatment due to chronic renal failure. They were attended dialysis centers in Medical Center of Al- Hussian Hospital. Healthy individuals (15) were used as a control group. Five ml of brachial vein blood were drawn from each subject. Sera were separated after centrifugation at 3000 rpm for 10 minutes, and stored at -20 C°. In formations were recorded from patients using questionnaire paper.

ELISA kits (forsite kits , Germany), were used to detect IgG and IgM anti-*T. gondii* antibodies, which were performed following the manufacturer´s instructions.

III. RESULTS

The seroprevalence of *Toxoplasma gondii* antibodies.

A-Renal Failure

1- According to the sex

Table 1. Shows the high seropositive percentage of IgG+ (36%) of examined patient (41.4% female, 28.6% male) .There is no IgM+, or IgG+; IgM+ antibodies, while the percentage of negative (IgM-, IgG-) was 64%.

Table 1. The seroprevalence of *Toxoplasma gondii* antibodies is according to the sex of renal failure patient.

Sex	**Positive**		**Negative**	
	No.	**%**	**No.**	**%**
Male = 42	12 [b]	28.6	30 [a]	71.4
Female = 58	24 [a]	41.4	34 [a]	58.6
Total= 100	36	36	64	64
Statistics	$X^2=7$ DF=3 P≤ 0.08			

Different small letter mean significant difference

2- According to age groups.

Table 2.Shows the high seroprevalence rate of IgG+ (53.3%) found in (40-49) years, while the low seroprevalence (27.8%) in (20-29) years. The total percentage of negative antibodies (IgG-, IgM-) of the patients (64%).

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Table 2. The seroprevalence of *Toxoplasma* antibodies in renal failure patient is according to age groups.

Age(Year)	IgG+		IgG+ & IgM+		Statistics
	No	%	No	%	
20 – 29 n= 18	5 [b]	27.8	13 [a]	72.2	
30- 39 n = 28	8 [a]	28.6	20 [a]	71.4	$X^2=10$ DF=7 P≤ $0.09^{N.S}$
40- 49 n= 30	16 [a]	53.3	14 [a]	46.7	
50- 59 n= 24	7 [a]	29.2	17 [a]	70.8	
Total 100	36 [a]	36	64 [a]	64	
Statistics	$X^2=8$ DF=3 P≤ 0.05*		$X^2=0.37$ DF= 3 P≤ 0.8		

- Mean significant

3-According to the residency.

Table 3. Shows the high seropositive value of IgG+ (40.38%) found in urban area. The lowest IgG positive of rural area was (39.47%). No IgM or (IgM; IgG) antibodies found.

Table 3. The seroprevalence of toxoplasmosis (IgG+) in patients with renal failure is according to the residency.

	Urban	rural	Total	Statistics
No.	21	15	36	$X^2=10$ DF= 1 P≤ 0.008^*
%	58.3	41.7	36	

B- Applicants of marriage

1-According to sex

Table 4. Shows the total percentage 26% of positive antibodies of *Toxoplasma* of applicants of marriage (34% female, and 18% male) ,while the total percentage of negative antibodies (IgM-, IgG-)was 74 % (66% female, 82% male). No IgM+, or IgM+; IgG+, was recorder in the present study.

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Table 4. Seroprevalence of *T. gondii* antibody (ELISA test) according to the male and female of applicant for marriage people.

Gender	**Positive**		**Negative**	
	No	**%**	**No**	**%**
Male =50	9 [b]	18	41[a]	82
Female=50	17 [b]	34	33 [a]	66
Total=100	26 [b]	26	74 [a]	74
Statistics	X^2 =17 DF=3 P≤ 0.001*			

2- According to the residency.

Table 5. Shows the total positive of *Toxoplasma* antibodies was found in 26% of people applicants for marriage in urban area 28% and 24 % in rural area. No IgM+, or IgM+; IgG+, was recorded. The total negative of *Toxoplasma* antibodies IgG-, IgM- was 74%

Table 5. Seroprevalence of *T. gondii* antibodies are according to the residency of applicant for marriage peoples using ELISA test.

Residency	**Positive**		**Negative**		**Statistic**
	No	**%**	**No**	**%**	
Rural =46	11 [b]	24	34 [a]	75	X^2 =12 DF=1 P≤ 0.001*
Urban =54	15 [b]	28	41 [a]	73	X^2 =12 DF=1 P≤ 0.001*
Total =100	26 [b]	26	75 [a]	75	X^2 =23 DF=1 P≤ 0.001*

Figure (1) shows the amplication of *T. gondii* 580 bp, fragment gene of renal failure groups and Figure (2) shows the amplification of *T. gondii* 193 bp fragment gene of applicants of marriage.

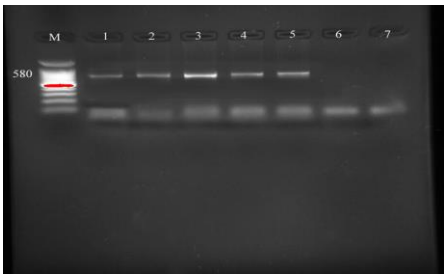

Figure 1: PCR amplification of *T. gondii*, 580 bp, fragment gene in 1.5% agarose gel, of renal failure groups.

M=ladder

Lane 1-5= positive PCR

Lane 6-7= negative control

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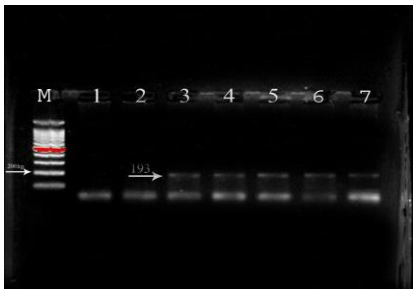

Figure 2: PCR amplification of *T. gondii*, 193 bp fragment gene in 1.5% agarose gel, of applicants of mareage.

M= Ladder

Lane 1, 2 = negative PCR

Lane 3, 4, 5, 6, 7= positive PCR

IV. DISCUSSION

The seroprevalence of toxoplasmosis in female was 41.4% which is higher than male 28.6%, this agree with Abdul –Azize in Baghdad city who showed that the seropositive rate in female 55.8% is higher than in male 44.18% [11] , and Al-Shikhly study which showed the seropositive in female 38.45%, and in male 12.83% [12] . But the result does not agree with Al-Rikabby in Thi-Qar province which showed that the male seroprevalence was 35.18% higher than female 19.56% [13].

The difference between male and female infection with toxoplasmosis is not clear, it may be due to the difference in reaction between the patient and parasite which effective by immune system.

The higher seroprevalence 53.3% which was found in (40-49) age group. The high seroprevalence in old age group is maybe due to the increase contact with causative agent, and the decrease the immunity in old age patients.

The above result agrees with Al-Rikaby study in Thi-Qar province [13], which showed the high seroprevalence in (40-45), but not agree with Al-Khanaq study in Wassit which showed the high seroprevalence in (21-30) years [14].

The current study shows a significant difference between the rural and urban area. This result agree with Al-Ghazy study in Thi-Qar province which showed the higher rate is in urban more than rural [15]. But does not agree with Mohmmed study in Al-Ramadi which showed the rural area is higher than urban area [16].

The high seroprevalence 58.3% was found in urban area which is higher than in rural area 41.7%. The high seroprevalence of toxoplasmosis in urban than rural may be due to the contamination and crowd in the city which is more than that in rural, and in rural the cat depressed the fesses in wide area which decrease the infection rate, while in urban it is depressed the feces in garden and this increased the infection rate [17].

The current study shows there are a significant differences according to sex was 26% (18% for male , 34% for female), this result show agree with Sajidah study in Karbala city which show there's significant difference between sex [18].

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The study show significant differences according to the residency, this result agrees with Hawaar study in Erbil city which shows that there was relationship between the prevalence of toxoplasmosis and residency [19].

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